Installation and Operating Instructions

DGPS/Glonass receiver AG-STAR

Version: V5.20150602

3030247600-02-EN

Read and follow these operating instructions.

Keep these operating instructions in a safe place for later reference.

Company details

Document

Installation and Operating Instructions
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1 For your safety

1.1 Basic safety instructions

Please read the following safety instructions carefully before using the product for the first time.

- Do not make any unauthorized modifications to the product. Unauthorized modifications or use may impair safety and reduce the service life or operability of the unit. Modifications are considered unauthorized if they are not described in the product documentation.
- Comply with road traffic rules. Stop the vehicle before operating the GPS receiver or connected components.

1.2 Intended use

The product is intended for accurate positioning of agricultural vehicles.

The product is intended exclusively for use in agriculture. The manufacturer shall not be held responsible for any other use of the system.

The operating instructions form part of the product. The product may only be used in accordance with these operating instructions.

The manufacturer cannot be held liable for any personal injury or property damage resulting from such non-compliance. All risk arising from improper use lies with the user.

1.3 Layout and meaning of warnings

All safety instructions found in these Operating Instructions are composed in accordance with the following pattern:

	⚠ WARNING
	This signal word identifies medium-risk hazards, which could potentially cause death or serious physical injury, if not avoided.

	⚠ CAUTION
	This signal word identifies low-risk hazards, which could potentially cause minor or moderate physical injury or damage to property, if not avoided.

NOTICE
This signal word identifies actions which could lead to operational malfunctions if performed incorrectly. These actions require that you operate in a precise and cautious manner in order to produce optimum work results.

There are some actions that need to be performed in several steps. If there is a risk involved in carrying out any of these steps, a safety warning will appear in the instructions themselves.

Safety instructions always directly precede the step involving risk and can be identified by their bold font type and a signal word.

Example

1. NOTICE! This is a notice. It warns that there is a risk involved in the next step.
2. Step involving risk.

1.4 Disposal

When it has reached the end of its service life, please dispose of this product as electronic scrap in accordance with all applicable waste management laws.

2 Product description

2.1 About the GPS receiver

The DGPS/Glonass receiver is used to determine the exact position of a vehicle during field work.

The GPS receiver can be used worldwide. In Europe and North America, it works with the GPS system and the WAAS and EGNOS correction systems. In locations where WAAS and EGNOS cannot be used, the GPS receiver can use the GPS system together with Glonass satellites. The correction signal is then calculated internally (using GL1DE technology).

Glonass

Glonass is a Russian satellite system which can be used in addition to the American GPS system.

WAAS and EGNOS

WAAS and EGNOS are satellite-based correction services which can be used in Europe and North America.

GL1DE

GL1DE technology can be used in parallel to other methods. This thus further increases path-to-path accuracy. [➞ 10]

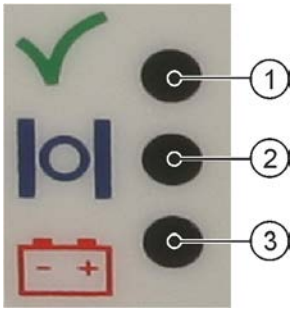
Accuracies

- Path-to-path accuracy describes the maximum displacement of the GPS position during field work. A path-to-path accuracy of 2.5 cm means that the overlap or defect during parallel movements is a maximum of 2.5 cm.
- Absolute accuracy is the accuracy with which a movement can be repeated after days, months or years. An absolute accuracy of 2.5 cm means that the deviation of a movement after one year is a maximum of 2.5 cm. This maximum deviation

also applies if, after one year has passed, you use the field limits, guidance lines, obstacles, etc. in the TRACK-Leader application from the previous year.

2.2 Meaning of the LED lights

The GPS receiver has three LED lights, which display the current state of the GPS receiver.



1	Green LED light	3	Red LED light
2	Yellow LED light		

- Green:
  - Flashing: The GPS receiver is searching for WAAS and EGNOS correction signals
  - Lit: The GPS receiver is using WAAS and EGNOS correction signals.
- Yellow:
  - Flashing: The GPS receiver is receiving GPS or Glonass signals.
  - Lit: The GPS receiver has calculated the current position.
- Red:
  - Lit: The GPS receiver is ready (approx. 30 seconds after the terminal is switched on).

If you selected the selected the values "GPS/Glonass GL1DE 1" or GPS/Glonass GL1DE 2"" during Configuration [→ 11], the green LED is not used. The GPS receiver will only use the internal correction signal.

3 Mounting and configuration

3.1 Mounting the GPS receiver

GPS receiver on the roof of a tractor

NOTICE

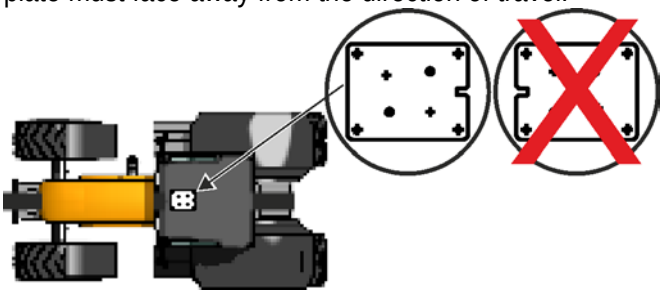
The GPS receiver needs an open view of the sky.

- Mount the GPS receiver on the roof of the vehicle cabin.
- Avoid obscuring the GPS receiver's view of the sky.

Procedure

You fit the GPS receiver as follows:

1. Identify a suitable location on the roof of the vehicle: as far forward as possible, and in the center of the vehicle.
2. Use alcohol to clean the position on which will you want to mount the GPS receiver.
3. Expose the adhesive surface of the magnetic plate. The notch in the magnetic plate must face away from the direction of travel.



4. Place the GPS receiver onto the magnetic plate so that it locks. The connection must thus face away from the direction of travel.

⇨ You have now mounted the GPS receiver onto the roof of the vehicle.

⇨ You can now connect the GPS receiver to a terminal.

3.2 Connecting the GPS receiver to a terminal

⚠ CAUTION

Terminal connector supplying power
Potential damage to the terminal from a short-circuit.

- Switch the terminal off before plugging in or removing the connector.

Procedure

This is how you connect the GPS receiver to a terminal:

1. Switch off the terminal.
2. Guide the cable of the GPS receiver into the vehicle cab.
3. Find the appropriate RS232 connection on the terminal. Refer to the operating instructions for the terminal to find out which connection this is. On most Müller-Elektronik terminals, this is connection C.

⇨ You have now connected the GPS receiver to the terminal.

3.3 Activating the driver of the GPS receiver on a terminal

You will need to activate the GPS receiver differently depending on where you have connected it.

Version	Driver
Via the terminal's serial interface	"AG-STAR, SMART-6L" or "GPS_STD"
Via the TRACK-Leader TOP steering job computer	"PSR CAN"
Via the TRACK-Leader AUTO steering job computer	"TRACK-Leader AUTO"

You can read how to activate a driver in the operating instructions for the terminal.

3.4 Configuring the GPS receiver

The GPS receiver can be configured differently for various terminals. You can find out how to do this in the operating instructions for the terminal.

The following tables show the values which you can select in the parameter "correction signal" during configuration:

Europe

Value	Used satellites and correction signals	Advantages	Notes	Accuracies
EGNOS-EU	▪ 12 GPS satellites ▪ 2 EGNOS correction signals			▪ P-t-P: 15cm ▪ Abs.: 70cm
EGNOS-EU + GL1DE	▪ 12 GPS satellites ▪ 2 EGNOS correction signals ▪ Internal GL1DE correction signal	▪ The internal correction further increases path-to-path accuracy.	▪ Is not recommended for use with the steering system. The steering does not run smoothly with this correction signal.	▪ P-t-P: <15 cm ▪ Abs.: 70cm

North America

Value	Used satellites and correction signals	Advantages	Notes	Accuracies
WAAS-US	▪ 12 GPS satellites ▪ 2 WAAS correction signals			▪ P-t-P: 15cm ▪ Abs.: 70cm
WAAS-US + GL1DE	▪ 12 GPS satellites ▪ 2 WAAS correction signals ▪ Internal GL1DE correction signal	▪ The internal correction further increases path-to-path accuracy.	▪ Is not recommended for use with the steering system. The steering does not run smoothly with this correction signal.	▪ P-t-P: <15 cm ▪ Abs.: 70cm

Japan

Value	Used satellites and correction signals	Advantages	Notes	Accuracies
MSAS-JP	▪ 12 GPS satellites ▪ 2 MSAS correction signals			▪ P-t-P: 15cm ▪ Abs.: 70cm
MSAS-JP + GL1DE	▪ 12 GPS satellites ▪ 2 MSAS correction signals ▪ Internal GL1DE correction signal	▪ The internal correction further increases path-to-path accuracy.	▪ Is not recommended for use with the steering system. The steering does not run smoothly with this correction signal.	▪ P-t-P: <15 cm ▪ Abs.: 70cm

Worldwide

Value	Used satellites and correction signals	Advantages	Accuracies
GPS/Glonass GL1DE 1	▪ 10 GPS satellites ▪ 4 Glonass satellites ▪ Internal GL1DE correction signal	▪ Higher number of available satellites. ▪ The internal correction increases path-to-path accuracy.	▪ P-t-P: 25 cm ▪ Abs.: 150 cm
GPS/Glonass GL1DE 2	▪ 8 GPS satellites ▪ 6 Glonass satellites ▪ Internal GL1DE correction signal	▪ Higher number of available satellites. ▪ The internal correction increases path-to-path accuracy.	▪ P-t-P: 25 cm ▪ Abs.: 150 cm

P-t-P = path-to-path accuracy

Abs. = Absolute accuracy

Information for GL1DE

If you have selected a correction signal with GL1DE, please note:

- Switch the GPS receiver off when driving on roads.
- After starting the systems each time, it takes ca. 5 minutes until the system is ready for operation. Wait on the field to be worked during this time, before you start working.

- Ensure that the GPS receiver does not lose the GPS signal during work. If the signal gets lost, it can cause the GL1DE to restart. This can lead to track offset.

4 Technical specifications

Properties

Operating voltage	8 – 36 V DC
Current consumption	208 mA at 12 V DC
Power input	2.5 W
GPS standard	NMEA 0183

Configuration

Frequencies	5 Hz (GPGGA, GPVTG)
	1 Hz (GPGSA, GPZDA)
Transmission rate	19200 baud
Data bits	8
Parity	no
Stop bits	1
Flow control	None

5 List of accessories

Complete GPS receiver package with cable

Item number	Item name
3030247600	DGPS/Glonass receiver AG-STAR Connector cable to the terminal: 6m
3030247605	DGPS/Glonass receiver AG-STAR Connector cable to the steering job computer

GPS receiver with no connector cable

Item number	Item name
3130247600	DGPS/Glonass receiver AG-STAR
3130247605	DGPS/Glonass receiver AG-STAR without cable for steering job computer

Connection cable

Item number	Item name
31302476	Connector cable - DGPS/Glonass receiver to terminal
31302453	Adapter cable for connection to the TRACK-Leader TOP steering job computer

Mounting accessories

Item number	Item name
3130247601	DGPS/Glonass receiver – Magnetic plate and adhesive tape